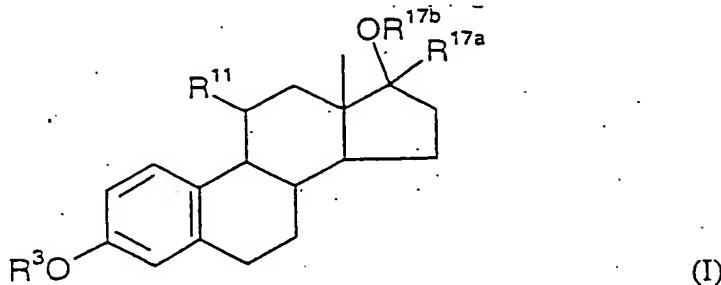


Claims:

1. 11 β -Long-chain-substituted estratrienes of general formula I



in which

R^3 means a hydrogen atom, a hydrocarbon radical with up to 8 carbon atoms or a radical of partial formula $R^{3'}-C(O)-$, in which $R^{3'}$ means a hydrogen atom or a hydrocarbon radical with up to 8 carbon atoms or a phenyl radical,

R^{11} means a radical of formula -A-B-Z-R²⁰,

in which

A stands for a direct bond, and

B stands for a straight-chain or branched-chain alkylene, alkenylene or alkinylene group with 4, 5 or 6 carbon atoms, or

A stands for a phenylene radical, and

B stands for a methylene, ethylene, propylene or trimethylene group, or

A stands for a phenylenoxy radical, whereby the latter is bonded via a carbon atom to the 11-carbon atom of the steroid, and

B stands for an ethylene group,

Z stands for $-NR^{21}-$ and R^{21} stands for a C_1-C_3 alkyl group,

whereby R^{20} means

a hydrogen atom,

a straight-chain or branched-chain alkyl,

alkenyl or alkinyl group with up to 10 carbon atoms,

whereby if A is a direct bond, R^{20} and R^{21} do not both simultaneously mean methyl, however, and, if A is a phenylenoxy radical, R^{20} and R^{21} do not both simultaneously mean methyl or ethyl, and if A is a phenylenoxy radical and B means an ethylene group, OR^{17b} should not be a hydroxy group and R^{17a} should not be a C_{1-4} alkyl group, and R^3 should not be a hydrogen atom,

or one of groupings

$-D-C_nF_{2n+1}$, whereby D is a straight-chain or branched-chain alkylene, alkenylene or alkinylene group with up to 8 carbon atoms and n is an integer from 1 to 8,

D-aryl, whereby D has the already indicated meaning, and aryl stands for a phenyl, 1- or

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2-naphthyl radical or a heteroaryl radical that is optionally substituted in one or two places,

$-L-CH=CF-C_pF_{2p+1}$, whereby L is a straight-chain or branched-chain alkylene, alkenylene or alkynylene group with up to 7 carbon atoms and p is an integer from 1 to 7,

whereby in the three cases above in D or L, a methylene group can be replaced by a sulfur atom, a sulfone group or a sulfoxide group,

$-D-O-(CH_2)_q\text{-aryl}$, whereby D and aryl have the already indicated meanings, and q is 0, 1, 2 or 3,

$-D-O-(CH_2)_r-C_nF_{2n+1}$, whereby D and n have the already indicated meanings, and r stands for an integer from 1 to 5,

whereby in addition in all relevant cases above, R²¹ together with D with the inclusion of the nitrogen atom can then form a pyrrolidine ring that is substituted in 2- or 3-position,

or

if A is a direct bond or a phenylene radical, R²⁰ and R²¹ with the nitrogen atom to which they are bonded form a saturated or unsaturated heterocyclic compound with 5 or 6

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chain links, which optionally contains one or two additional heteroatoms, selected from nitrogen, oxygen and sulfur, and optionally is substituted,

whereby if A is a phenylene radical and B is a trimethylene radical, R²¹ and R²⁰ do not form a methyl or ethyl group, or, together with the nitrogen atom to which they are bonded, do not form a pyrrolidine or piperidine ring,

and

R^{17a} in α- or β-position means a hydrogen atom, a C₁₋₅ alkyl, a C₂₋₅ alkenyl or a C₂₋₅ alkynyl group or a trifluoromethyl group, or together with the radical OR^{17b} means a keto-oxygen atom, and R^{17b} means a hydrogen atom or a radical of partial formula R^{17'}--C(O)--, in which R^{17'} means a hydrogen atom or a hydrocarbon radical with up to 8 carbon atoms.

2. 11β-Substituted estratrienes according to claim 1, in which R³ is a hydrogen atom.

3. 11β-Substituted estratrienes according to claim 1, in which R³ is a benzoyl radical.

4. 11β-Substituted estratrienes according to claim 1, in which R^{17b} is a hydrogen atom.

5. 11β-Substituted estratrienes according to claim 1, in which R¹¹ is selected from the group of the following side chains

$-(CH_2)_5N(CH_3)-(CH_2)_3S-(CH_2)_3C_2F_5$
 $-(CH_2)_5NH-(CH_2)_3S-(CH_2)_3C_2F_5$
 $-(CH_2)_5N(CH_3)-(CH_2)_3S-CH_2-2\text{-Pyridyl}$
 $-(CH_2)_5N(CH_3)-(CH_2)_3SO-CH_2-2\text{-Pyridyl}$
 $-(CH_2)_5N(CH_3)-(CH_2)_3S-CH_2-p-CF_3\text{-Phenyl}$
 $-(CH_2)_5N(CH_3)-(CH_2)_3SO-CH_2-p-CF_3\text{-Phenyl}$
 $-(CH_2)_5-[2\text{-Pyrrolidin-1-yl}]-CH_2-S-p-CF_3\text{-Phenyl}$
 $-(CH_2)_5-[2\text{-Pyrrolidin-1-yl}]-CH_2-SO-p-CF_3\text{-Phenyl}$
 $p\text{-Phenylen-}(CH_2)_2-N(CH_3)-(CH_2)_3S-(CH_2)_3C_2F_5$
 $p\text{-Phenylen-}(CH_2)_2-N(CH_3)-(CH_2)_3SO-(CH_2)_3C_2F_5$
 $p\text{-Phenylen-}(CH_2)_2-N(CH_3)-(CH_2)_3S-CH_2-2\text{-Pyridyl}$
 $p\text{-Phenylen-}(CH_2)_2-N(CH_3)-(CH_2)_3SO-CH_2-2\text{-Pyridyl}$
 $p\text{-Phenylen-}(CH_2)_2-N(CH_3)-(CH_2)_3S-CH_2-p-CF_3\text{-Phenyl}$
 $p\text{-Phenylen-}(CH_2)_2-N(CH_3)-(CH_2)_3SO-CH_2-p-CF_3\text{-Phenyl}$

 $-(CH_2)_5N(CH_3)(CH_2)_3C_2F_5$
 $-(CH_2)_5N(CH_3)(CH_2)_6C_2F_5$
 $-(CH_2)_5N(CH_3)(CH_2)_7C_2F_5$
 $-(CH_2)_5N(CH_3)(CH_2)_8C_2F_5$
 $-(CH_2)_6N(CH_3)(CH_2)_6C_2F_5$
 $-(CH_2)_6N(CH_3)(CH_2)_7C_2F_5$
 $-(CH_2)_6N(CH_3)(CH_2)_8C_2F_5$
 $-(CH_2)_5N(CH_3)(CH_2)_2C_4F_9$
 $-(CH_2)_5N(CH_3)(CH_2)_3C_6F_{13}$
 $-(CH_2)_5N(CH_3)(CH_2)_3C_8F_{17}$
 $-(CH_2)_5N(CH_3)(CH_2)_6C_4F_9$

$-(CH_2)_5N(CH_3)(CH_2)_6C_6F_{13}$
 $-(CH_2)_5N(CH_3)(CH_2)_6C_8F_{17}$
 $-(CH_2)_5N(CH_3)H$
 $-(CH_2)_5N(CH_3)(CH_2)_9H$
 $-(CH_2)_5N(CH_3)CH_2CH=CF-C_2F_5$
 $-(CH_2)_5N(CH_3)CH_2CH=CF-C_3F_7$
 $-(CH_2)_5N(CH_3)CH_2CH=CF-C_5F_{11}$
 $-(CH_2)_5N(CH_3)CH_2CH=CF-C_7F_{15}$
 $-(CH_2)_5\text{-1-Pyrrolidinyl}$
 $-(CH_2)_5N(CH_3)(CH_2)_3O\text{Phenyl}$
 $-(CH_2)_5N(CH_3)(CH_2)_3OBenzyl$
 $-(CH_2)_5N(CH_3)(CH_2)_3O(CH_2)_3C_2F_5$
 $-(CH_2)_5N(CH_3)(CH_2)_3CH(CH_3)_2$
 $-(CH_2)_5N(CH_3)(CH_2)_3\text{-Pyridyl}$
 $-(CH_2)_5N(CH_3)(CH_2)_3\text{-Phenyl}$
 $-(CH_2)_5N(CH_3)(CH_2)_2\text{-p-Tolyl}$
 $-(CH_2)_5N(CH_3)(CH_2)_2\text{-p-Ethoxypyhenyl}$
 $-(CH_2)_5N(CH_3)(CH_2)_3\text{-p-Tolyl}$
 $-(CH_2)_5N(CH_3)(CH_2)_3\text{-p-Chlorphenyl}$
 $-(CH_2)_5N(CH_3)(CH_2)_3O\text{-CH}_2\text{-Phenyl}$

[Key:]

$-(CH_2)_5\text{-[2-Pyrrolidin-1-yl]}-\dots = (CH_2)_5\text{-[2-pyrrolidine-1-yl]}-\dots$

p-Phenylen-... = p-phenylene-...

6. 11 β -Long-chain-substituted estratrienes of general formula I, namely

11 β -[5-(Methyl{3-[(4,4,5,5,5-pentafluoropentyl)sulfanyl]-propyl}amino)pentyl]estra-1,3,5(10)-triene-3,17 β -diol

11 β -[5-{3-[(4,4,5,5,5-pentafluoropentyl)sulfanyl]-propylamino}pentyl]estra-1,3,5(10)-triene-3,17 β -diol

11 β -[5-(methyl{3-[(2-pyridylmethyl)sulfanyl]propyl}-amino)pentyl]estra-1,3,5(10)-triene-3,17 β -diol

11 β -[5-(methyl{3-[(2-pyridylmethyl)sulfinyl]propyl}-amino)pentyl]estra-1,3,5(10)-triene-3,17 β -diol

11 β -[5-(methyl{3-[4-(trifluoromethyl)benzylsulfanyl]-propyl}amino)pentyl]estra-1,3,5(10)-triene-3,17 β -diol

11 β -[5-(methyl{3-[4-(trifluoromethyl)benzylsulfinyl]propyl}-amino)pentyl]estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[(2S)-2-{[4-(trifluoromethyl)phenyl}sulfanyl-methyl]pyrrolidine-1-yl]pentyl}estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[(2S)-2-{[4-(trifluoromethyl)phenyl}sulfinyl-methyl]pyrrolidine-1-yl]pentyl}estra-1,3,5(10)-triene-3,17 β -diol

11 β -{4-[2-(methyl{3-[(4,4,5,5,5-pentafluoropentyl)sulfanyl]-propyl}amino)ethyl]phenyl}estra-1,3,5(10)-triene-3,17 β -diol

11 β -{4-[2-(methyl{3-[(4,4,5,5,5-pentafluoropentyl)sulfinyl]-propyl}amino)ethyl]phenyl}estra-1,3,5(10)-triene-3,17 β -diol

11 β -{4-[2-(methyl{3-[(2-pyridylmethyl)sulfanyl]propyl}-amino)ethyl]phenyl}estra-1,3,5(10)-triene-3,17 β -diol

11 β -{4-[2-(methyl{3-[(2-pyridylmethyl)sulfinyl]propyl}-amino)ethyl]phenyl}estra-1,3,5(10)-triene-3,17 β -diol

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11 β -{4-[2-(methyl{3-[4-(trifluoromethyl)benzylsulfanyl]-propyl}amino)ethyl]phenyl}estra-1,3,5(10)-triene-3,17 β -diol

11 β -{4-[2-(methyl{3-[4-(trifluoromethyl)benzylsulfinyl]propyl}amino)ethyl]phenyl}estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[methyl-(8,8,9,9,9-pentafluoro-nonyl)amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[methyl-nonyl-amino]pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[methyl-(9,9,10,10,10-pentafluoro-decyl)-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{6-[methyl-(8,8,9,9,9-pentafluoro-nonyl)-amino]-hexyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{6-[methyl-(9,9,10,10,10-pentafluoro-decyl)-amino]-hexyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -[5-(methyl-amino)-pentyl]-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{(5-pyrrolidine-1-yl-pentyl)-estra-1,3,5(10)-triene-3,17 β -diol}

11 β -{5-[methyl-(4,4,5,5,5-pentafluoro-pentyl)-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[methyl-(4,4,5,5,6,6,7,7,8,8,9,9,9-tridecafluorononyl)-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[(4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,11-heptadecafluoro-undecyl)-methyl-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[methyl-(3,3,4,4,5,5,6,6,6-nonafluoro-hexyl)-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[methyl-(7,7,8,8,8-pentafluoro-octyl)-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{6-[methyl-(7,7,8,8,8-pentafluoro-octyl)-amino]-hexyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[methyl-(7,7,8,8,9,9,10,10,10-nonafluoro-decyl)-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[methyl-(7,7,8,8,9,9,10,10,10,11,11,12,12,12-tridecafluoro-dodecyl)-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[(7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-heptadecafluoro-tetradecyl)-methyl-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[(3,4,4,5,5,5-hexafluoro-pent-2-enyl)-methyl-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[(3,4,4,5,5,6,6,7,7,8,8,8-dodecafluoro-oct-2-enyl)-methyl-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[(3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-hexadecafluoro-dec-2-enyl)-methyl-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[methyl-(3-phenoxy-propyl)-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[(3-benzyloxy-propyl)-methyl-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[N-methyl-N-3-(4,4,5,5,5-pentafluoropentyloxy)-propylamino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -[9-(4,4,5,5,5-pentafluoropentylsulfinyl)-nonyl]-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[methyl-(2-p-tolyl-ethyl)-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[(2-(4-ethoxy-phenyl)-ethyl)-methyl-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[methyl-(3-phenyl-propyl)-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[methyl-(3-pyridin-3-yl-propyl)-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[methyl-(3-p-tolyl-propyl)-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[(3-(4-chloro-phenyl)-propyl)-methyl-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[(3-(4-ethoxy-phenyl)-propyl)-methyl-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

11 β -{5-[methyl-(4-methyl-pentyl)-amino]-pentyl}-estra-1,3,5(10)-triene-3,17 β -diol

7. Use of the compounds of general formula I according to claim 1 for the production of pharmaceutical agents.

8. Pharmaceutical preparations that contain at least one compound of general formula I according to claim 1 as well as a pharmaceutically compatible vehicle.